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Sexual dysfunction and sexual life satisfaction among male students

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Purpose: Research on adolescent sexual health is mainly based on risky behaviour and health outcomes, whereas sexual functioning in adolescence is poorly investigated. The main aim of the study was to determine the prevalence of erectile dysfunction and premature ejaculation among sexually active first-year male college and university students, and its association with sexual life satisfaction.

Methods: A total of 174 first-year male college students filled out an anonymous, self-administered questionnaire on medical information, behavioural risk factors, and sexual life.

Results: The current study showed the prevalence of erectile dysfunction and premature ejaculation of 17.8% and 9.8%, respectively. Only 4.6% of the participants acknowledged erection difficulties. Young men dissatisfied with personal sexual life had a seven-fold greater probability to experience erectile dysfunction (OR 6.75; CI 2.85-15.85; p<0.001).

Conclusion: Bearing in mind the specificity of adolescent population, sensitivity of the subject, and often unawareness of erectile dysfunction, approach should be pragmatic. Sexual life dissatisfaction proved to be strongly related to erectile dysfunction. In order to detect those with potential disorder, professionals should initially ask about sexual life satisfaction rather than enquire directly into erection difficulties.

Key words: adolescent, erectile dysfunction, premature ejaculation

INTRODUCTION

Sexual health is outlined by the Word Health Organization as a state of physical, emotional, mental and social well-being in relation to sexuality, implying a positive and respectful approach to sexuality, sexual relationships, as well as the possibility of having pleasurable sexual experiences (1). Sexual dysfunction affects not only personal but also partner's quality of life, as demonstrated in numerous studies (2-4).

Erectile dysfunction (ED) and premature ejaculation (PE) are the most frequent sexual dysfunction issues in adult population, although comorbidity of sexual difficulties has been reported quite common (5-7).

Erectile dysfunction is defined as the inability to attain and/or maintain penile erection sufficient for satisfactory sexual performance (8). The possible aetiology of ED in men aged under 40 is vasculogenic (i.e. Peyronie's disease), neurogenic (i.e. multiple sclerosis), endocrine (i.e. diabetes mellitus), medication-induced (i.e. non-steroid anti-inflammatory drugs), or as the effect of psychological factors (9). Smoking is an independent modifiable risk factor associated with ED occurrence (10). Due to inconsistent data, the role of other related behavioural risk factors require further investigation, i.e. alcohol and drug consumption, obesity, sedentary lifestyle, and cycling (10-15). The overall ED prevalence varies between 5% and 52%, depending on the method, classification and target population used in the study, and it is proven to be positively associated with age (10,16,17).

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According to the research available, the youngest examinees from the general population (18 to 40 years) report least problems with ED and most with PE (17, 18).

Premature ejaculation has been extensively discussed considering the lack of standardization in defining the disorder, differences between life-long PE (LPE) and acquired PE (APE), and study design. Nonetheless, evidence suggests that it is the most common sexual symptom reported, with a prevalence of approximately 30% (6, 19). In 2013, the International Society for Sexual Medicine proposed a unified definition for LPE and APE including ejaculatory latency, perceived lack of control over ejaculation, and negative personal consequences. The pathophysiology of PE remains unclear, although psychological (i.e. relationship factors), neurobiological (i.e. serotonin receptor disturbances) and somatic factors (i.e. hyperthyroidism) have been hypothesised. Unlike ED, age is not a risk factor for PE (20).

Sexual functioning has been rarely studied in Croatian men. *Štulhofer and Bajić* conducted a face-to-face interview with 615 Croatian adult men (35-84 years of age) and recorded 13% of erectile difficulties and 10% of rapid ejaculation, and over twice as both as being at risk of ED or PE (21).

Research on adolescent sexual health in general is mainly based on investigating risky behaviour (i.e. age at sexarche, condom use, number of partners) and health outcomes (unwanted pregnancies and sexually transmitted infections). However, little research attention has been paid to sexual function in late adolescence. In a self-reported online survey, *O'Sullivan et al.* showed that more than half of males aged 16 to 21 years experienced sexual problems to some extent (22-24). *Mialon et al.* report on 11% of PE and 30% of ED among Swiss men under 25 years of age (25).

In Croatia, systematic check-ups (including sexual development and health monitoring) and counselling on reproductive health are mainly in the domain of school medicine specialists as part of preventive health care measures (Health Care Measure Plan and Program OG126/2006). School medicine services are well recognized and appreciated by adolescents (26). Data from the largest school medicine service (Zagreb, Croatia) show that almost one-third of all student counselling are on sexual and reproductive health issues (27). However, sexual dysfunction is rarely the reason students seek counselling. In order to improve sexual and reproductive health care measures, including early detection and intervention, better insight into Croatian adolescents' sexual dysfunction is needed.

The study aimed to determine the prevalence of sexual dysfunction (ED) among sexually active first-year college and university male students. Next, the study aimed to investigate sexual life satisfaction and its association with sexual dysfunction. Modifiable risk factors as potential predictors of ED are to be explored.

SUBJECTS AND METHOD

Participants

Study sample was randomly selected from first-year college and university male students at the University of Zagreb, Croatia, who attended regular systematic freshmen check-up at school medicine service. Between October 2013 and December 2013, a total of 180 students were recruited from the Faculty of Agriculture (n=35), Faculty of Forestry (n=37), Faculty of Economics and Business (n=36), Faculty of Electrical Engineering and Computing (n=34) and University of Applied Medical Sciences (n=38). Eligibility criteria, age 18-19 years and sexual experience in the previous six months were determined during systematic check-up. Every third student in alphabetical order who met the eligibility requirements was invited to participate. Students were individually informed on the purpose of the study, data confidentiality, possibility to withdraw at any moment, and were offered counselling by school medicine specialist. An informed consent was obtained from the subjects. Three students refused to participate and were replaced by the first next student meeting the inclusion criteria. Six participants were omitted due to poor quality of answers in the questionnaire, so the final sample consisted of 174 male adolescents.

Materials and procedure

The research instrument was anonymous, self-administered questionnaire, specifically constructed for this research, completed privately and returned to a sealed box. The questionnaire consisted of three parts: medical information, behavioural risk factors, and sexual life.

Medical information. Medical information section included the following data: body mass index (BMI) (calculated from self-reported body height and weight); having chronic disease (yes/no); regular medicine intake (yes/no); have had previous surgery or trauma in pelvic or abdominal area (yes/no).

Behavioural risk factors. Behavioural risk factors were measured as alcohol drinking (at least once a week/less than once a week); tobacco smoking (every day/less than every day); marijuana consuming (at least once a month/less than once a month); cycling (at least once a week/less than once a week); and engaged in sports (recreational/organised sports competition/none).

Sexual life. Erectile dysfunction was determined using the 5-item International Index of Erectile Function (IIEF-5) re-

TABLE 1. Distribution of medical information, behavioural risk factors, sexual life information and erectile dysfunction rate

Characteristic	Number of participants	%	Number of ED	Rate (95% CI)		
Medical information						
BMI (kg/m^2)						
<25	98	56.3	17	17.4	9.85	24.84
≥25	76	43.7	14	18.4	9.71	27.14
Chronic diseases						
no	158	90.8	27	17.1	11.22	22.96
yes	16	9.2	4	25	3.78	46.22
Regular medicine intake						
no	167	96.0	29	17.4	11.62	23.11
yes	7	4.0	2	28.6	-4.89	62.04
Surgery/trauma in abdominal/pelvic area						
no	160	92.0	29	18.1	12.16	24.09
yes	14	8.0	2	14.3	-4.04	32.62
Behavioural risk factors						
Alcohol at least once a week						
no	149	85.6	30	20.1	13.70	26.57
yes	25	14.4	1	4	-3.68	11.68
Smoking tobacco daily						
no	127	73.0	21	16.5	10.07	23.00
yes	47	27.0	10	21.3	9.58	32.98
Marijuana at least once a month						
no	161	92.5	28	17.4	11.54	23.25
yes	13	7.5	3	23.1	0.17	45.98
Engaged in sports						
no	28	16.1	7	25	8.96	41.04
recreational	104	59.8	19	18.3	10.84	25.70
organised competition	42	24.1	5	11.9	2.11	21.70
Cycling at least once a week						
no	111	63.8	19	17.1	10.11	24.12
yes	63	36.2	12	19.1	9.35	28.74
Sexual life						
Use of oral erectile dysfunction medications						
no	172	98.9	29	16.9	11.27	22.46
yes, medicine only	0					
yes, medicine with alcohol	2	1.1	2	100		
Self-perceived erection difficulties						
no	166	95.4	29	17.5	11.69	23.25
yes	8	4.6	2	25	-5.01	55.01
Premature ejaculation						
no	157	90.2	28	17.8	11.85	23.82
yes	17	9.8	3	17.7	-0.47	35.77
Sexual life satisfaction						
no	60	34.5	22	36.7	24.47	48.86
yes	114	65.5	9	7.9	2.94	12.84
Sexual intercourse in the last 3 months						
no	58	33.3	16	27.6	16.08	39.09
yes	116	66.7	15	12.9	6.82	19.04
Committed relationship						
no	87	50.0	23	26.4	17.17	35.70
yes	87	50.0	8	9.2	3.12	15.27

ED = erectile dysfunction; BMI = body mass index; CI = confidence interval

garding sexual confidence, attaining erection, maintaining erection, erectile durability, and intercourse satisfaction. Answers were graded from 1 to 5. Total score below 22 was classified as ED (17-21 mild, 12-16 mild to moderate, 8-11 moderate and ≤7 severe ED) (28, 29). For erectile dysfunction, a self-perception single question "Have you ever experienced difficulties achieving and/or maintaining erection?" was used, with yes/no answers possible. Premature ejaculation was evaluated using a single item ("Do you experience difficulties with premature ejaculation?") with yes/no answer offered.

Satisfaction with sexual life was measured using a single item ("How satisfied have you been regarding your sexual life?") with a five-point scale (from 1 = dissatisfied completely to 5 = completely satisfied). The answers 4 and 5 were treated as sexual life satisfaction, and answers 1 to 3 as discontent with personal sexual life.

For oral ED medicine intake ("Have you ever used any medication for erection enhancement?"), the possible answers were never, medicine only, and medicine combined with alcohol.

Current relationship status was determined as being in a committed relationship, and recent sexual activity as having had sexual intercourse in the past three months, both with yes/no answer offered.

Study design was approved by the Andrija Štampar Teaching Institute of Public Health Ethics Committee.

Statistical analysis

Frequency distributions of various risk factors (BMI, chronic illness, medicine intake, previous operation or trauma of the pelvic and/or abdominal area, smoking, alcohol and marijuana consumption, not engaged in sports activities, cycling) were determined for all students, as well as frequency distribution of sexual life satisfaction, PE and ED. Because of the small numbers in some subgroups, the "mild ED" and "mild to moderate ED" categories were merged into a single category, which we termed "ED".

Quantitative variables were tested for the normality of distribution with Kolmogorov-Smirnov test. For risk analysis, we used bivariate and multiple logistic regression. In bivariate analysis, dependent variable was ED (mild or mild to moderate) and independent variables were medical conditions, behavioural and sexual life factors. Variables with a $p<0.20$ in bivariate analysis were included in the multivariate model. All statistical calculations were performed using STATA/IC ver.11.1 (StataCorp. 2009, Stata Statistical Software: Release 11, College Station, TX, USA; StataCorp LP). Results of two-sided statistical tests in which p values were less than 0.05 were considered to be statistically significant.

RESULTS

The majority (78.2%) of the total sample of 174 students were 19 years of age. Nearly half (43.7%) of the subjects were overweight. Chronic medical conditions were reported by 9.2% and regular medicine intake by 4.0% of students. Eight percent had some surgical procedure and/or experienced trauma in the abdominal/pelvic area. Regular tobacco smoking was reported by 27.0% and alcohol consumption at least once *per* week by 14.4% of students. Thirteen (7.5%) students smoked marijuana at least once a month. Two students reported the use of medication for erection enhancement combined with alcohol. Many subjects were engaged in sports activities, 59.8% in recreational and 24.1% in organized sports competitions. One-third (36.2%) of the study population were riding a bicycle weekly.

Half of the students (50.0%) reported being in a committed relationship at the time of the research and 66.7% of all students were sexually active in the last three months.

Difficulties with PE was reported by 17 (9.8%) students. Difficulties in achieving and/or maintaining erection was acknowledged by 8 (4.6%) students. According to sexual life satisfaction scale, 65.5% of students were satisfied and 34.5% were dissatisfied with their sexual life (Table 1).

When asked specifically about the possible difficulties during sexual intercourse, such as sexual confidence, attaining erection, maintaining erection, erectile durability and intercourse satisfaction, any degree of ED (IIEF-5 score ≤21) was reported by 17.8% (CI 12.1- 23.5) of all respondents. Mild ED (IIEF-5 score 17-21) was found in 14.9% (CI 9.6-20.2) and mild to moderate ED (IIEF-5 score 12-16) in 2.9% (CI 0.4-5.4) of study subjects (Table 2).

TABLE 2. **Distribution of erectile dysfunction (IIEF-5 score) in first-year college and university male students**

Erectile dysfunction (IIEF-5 score)	Number of students	Rate (95% confidence interval)		
Yes	31	17.8	12.1	23.5
mild (17-21)	26	14.9	9.6	20.2
mild to moderate (12-16)	5	2.9	0.4	5.4
No	143	82.2	76.5	97.9

IIEF = International Index of Erectile Function

Chronic conditions, overweight and obesity were not relevant for higher probability of ED. Previous surgery or trauma, as well as substance use (tobacco, alcohol, and marijuana) were not associated with ED either. PE or self-perceived ED had no significant influence on IIEF-5 score. Young men dissatisfied with their personal sexual life had

TABLE 3. Odds ratio (OR) and 95% confidence intervals (CI) for risk of erectile dysfunction (IIEF-5 score) in first-year college and university male students

	OR	95% CI	p
Medical information			
BMI (kg/m^2)			
<25	1.0 (reference)		
≥25	1.07	0.49-2.35	0.85
Chronic disease			
no	1.0 (reference)		
yes	1.62	0.48-5.39	0.43
Regular medicine intake			
no	1.0 (reference)		
yes	1.90	0.35-10.29	0.45
Surgery/trauma in abdominal/pelvic area			
no	1.0 (reference)		
yes	0.75	0.16-3.55	0.72
Behavioural risk factors			
Alcohol at least once a week			
no	1.0 (reference)		
yes	0.17	0.02-1.27	0.084
Smoking tobacco daily			
no	1.0 (reference)		
yes	1.36	0.59-3.17	0.47
Marijuana at least once a month			
no	1.0 (reference)		
yes	1.42	0.37-5.51	0.61
Engaged in sports			
no	1.0 (reference)		
recreational	0.67	0.25-1.80	0.43
organised competition	0.41	0.11-1.44	0.16
Cycling at least once a week			
no	1.0 (reference)		
yes	1.14	0.51-2.53	0.75
Sexual life			
Self-perceived erection difficulties			
no	1.0 (reference)		
yes	1.57	0.30-8.19	0.59
Premature ejaculation			
no	1.0 (reference)		
yes	0.98	0.26-3.66	0.98
Sexual life satisfaction			
yes	1.0 (reference)		
no	6.75	2.85-15.85	<0.001
Sexual intercourse in the last 3 months			
yes	1.0 (reference)		
no	2.56	1.16-5.66	0.02
Committed relationship			
no	1.0 (reference)		
yes	0.28	0.12-0.67	0.004

IIEF = International Index of Erectile Function; BMI = body mass index

TABLE 4. Multivariate model to estimate erectile dysfunction (IIEF-5 score) in first-year college and university male students

Risk factor	Coefficient	SE	p
Constant	-2.09	0.52	<0.001
Sexual life dissatisfaction	1.73	0.51	0.001
Sexual intercourse in the last three months (no)	-0.17	0.52	0.748
Committed relationship (yes)	-0.54	0.57	0.341

IIEF = International Index of Erectile Function; SE= standard error

seven-fold greater probability to have ED (OR 6.75; CI 2.85-15.85; p<0.001). Those students that had not had sexual intercourse in the previous three months also had a higher probability of ED (OR 2.56; CI 1.16-5.66; p=0.02). Being in committed relationship proved to be a protective factor for ED; these students had by 72% lower probability to experience any ED (OR 0.28; CI 0.12-0.67; p=0.004) (Table 3).

In the multivariate model, only sexual life dissatisfaction remained a relevant factor influencing ED. Those students who were not satisfied with sexual life, when taking into account all study variables, had almost a twofold greater probability of having ED (OR 1.73, SE 0.51; p=0.001) (Table 4).

DISCUSSION

Research on sexual functioning is predominantly conducted among adult men and in subgroups suffering from chronic conditions. Very few studies were devoted to adolescents, presumably assuming that this population is predominantly quite healthy and is rarely affected by sexual difficulties.

The current study showed the prevalence of ED and PE of 17.8% and 9.8%, respectively. Risk factors such as increased BMI, existence of chronic disease or medicine intake, previous operation/trauma in the pelvic and/or abdominal area, tobacco/alcohol/marijuana consumption and cycling were not found to be significantly associated with an increased risk of ED. *Bajos et al.* found obesity and overweight to be associated with ED, however, the mechanisms remained less understood (30). McCabe and Connaughton state that BMI >25 could exert an indirect effect as part of other chronic diseases (i.e. diabetes mellitus), however, no statistical significance was found even when controlling for chronic illness in our study (31). Other authors suggest that when organic aetiology is excluded, diagnosis and treatment should be focused on self-esteem, relationship issues, self-perception, and signs of depression because various mental health issues proved to be predictive factors for PE and ED (32, 33).

The prevalence of PE recorded in the present study was consistent with previous studies (21, 25). Performance anxi-

ety and lower relationship satisfaction have been associated with PE (31). Performance anxiety has been attributed to the lack of experience, thus being expected to be more pronounced in younger population but also to improve over time (32). PE was not related to sexual life satisfaction, relationship status or recent sexual activity in our study.

The National Survey of Sexual Attitudes and Lifestyles in Britain has indicated that approximately half of oral medicated sex occurs among men without ED, with overall medicine intake prevalence of 3.6% in the 16-34 age group (34). *Harte and Meston* found the undergraduate students who reported recreational usage of oral ED medications to show lack of erectile confidence despite high erectile functioning scores (35). These results suggest that drugs in question could reflect more on self-perceiving sexual performance rather than ED *per se*. In our study, 1% of students experienced medicated sex, all with ED. Low ED medication intake in study population could be explained not only by high sexual confidence among those scored for ED, but also by restricted availability as being prescription-only medicine in Croatia.

In bivariate analysis, respondents who claimed to be in a committed relationship reported less ED. Those who did not have sexual intercourse in the last three months had greater probability for ED. Emotional engagement could be associated with sexual performance. *Smith et al.* suggest that psychological and relationship factors mediate sexual concern (36). Male adolescents of all ages wish for non-sexual behaviours rather than sexual behaviours in ideal romantic relationship (37). *Akre et al.* report that persistence of ED among young men aged 18 to 25 is related to multiple partners (32). Being unable to engage in emotional relationship could reflect on sexual performance. Likewise, the direction can be just the opposite; experiencing a sexual difficulty may make young men significantly less likely to enter a relationship. Due to the cross-sectional design of the study, we can only claim positive association of sexual satisfaction and ED but the causality is yet to be investigated.

Interestingly, in our study, only 4.6% students responded positively to questioning directly about ED. However, when narrowing questions to the possible specific issues such as sexual confidence, attaining erection, maintaining erection, erectile durability and intercourse satisfaction, specific problems of any degree were perceived by 17.8% of respondents in total. The question is whether they failed to recognize erectile difficulties or considered it to be normal. It is important to recognize that reluctance to report self-perceived ED was found among university students, a population cohort that might be considered best educated and advanced. It deserves further investigation to explore whether it is influenced by communication difficulties, shame, and fear of confidentiality violence, social pressure, or stigmatisation. It could be partly explained by the perception that mild ED (according to the IIEF-5 score) is mild and therefore not recognized as a problem. However, not perceiving it as a problem seems unlikely because sexual satisfaction has proved to be related to sexual dysfunction in our study, as well as in previous research (31, 36). Our results showed that the probability of having ED was sevenfold greater among students who reported sexual life dissatisfaction. This means that self-perception of one's sexual life is strongly related to ED and might be considered as a screening tool for ED in late adolescence.

Self-perception of erectile difficulties should be taken in consideration when expecting students to address the challenge and seek help by themselves. In general, patients think that discussion on sexual problems with primary care physicians should be initiated by doctor, and even those who prefer to start the discussion themselves do not object to be inquired during office visits or on medical history form (24). Being aware of the specificity of adolescent population (embarrassment, being afraid that parents would know about their sexual engagement, etc.), professionals, primarily those providing adolescent health care, should explore acceptable ways to screen for and investigate the possible sexual problems in young people (i.e. screening questionnaires, health education, individual/couple counselling).

The study had some limitations. The sample was small and it might be the reason for the lack of association with the selected risk factors. The study was cross-sectional and it was not possible to determine development and origin of sexual life dissatisfaction and compounds of ED. Secondly, the study was limited to college and university students only, thus implying the lack of information on the population not involved in high education. Another shortcoming of the study was omission of self-reported distress over the experienced sexual difficulty, as it would indicate whether and to what extent do students perceive the symptoms as problematic.

Practical implications

The current study showed that a substantial number of male students experienced some sexual difficulties. Providing comprehensive preventive health care for adolescents, professionals should tackle sexual dysfunction as an inseparable part of reproductive health care. The results indicated that prior to medical examination and counselling, it might be useful to offer a carefully tailored questionnaire to young men. Also, when discussing issues related to sexuality, it is very important not to remain on the surface of the problem by asking only routine, self-limited questions. Our results clearly showed that the components important for sexual

functioning should be taken into account and asked for because the problem is often unrecognized by adolescents themselves. The education and competence of health workers in counselling services enable them for early detection and screening for sexual dysfunction. However, bearing in mind the specificity of adolescent population, sensitivity of the subject and often unawareness of ED, the approach should be pragmatic. Sexual life dissatisfaction was proved to be strongly related to ED. Therefore, in order to early detect those with a potential disorder, professionals should initially ask about sexual life satisfaction rather than enquire directly into erection difficulties.

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SUMMARY

Seksualna disfunkcija i zadovoljstvo seksualnim životom u muških studenata

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Cilj: Istraživanje seksualnog zdravlja u adolescenata uglavnom se temelji na rizičnom ponašanju i zdravstvenim ishodima, dok se seksualna disfunkcija u adolescenciji rijetko ispituje. Glavni cilj ovoga istraživanja bio je utvrditi učestalost erektilne disfunkcije i prerane ejakulacije među seksualno aktivnim studentima prve godine visokih škola i fakulteta te povezanost s njihovim zadovoljstvom seksualnim životom.

Metode: Ukupno je 174 studenata prve godine samostalno ispunilo anonimni anketni list o medicinskim podacima, rizičnim čimbenicima ponašanja i seksualnom životu.

Rezultati: Ispitivanje je pokazalo učestalost erektilne disfunkcije od 17,8% i prerane ejakulacije od 9,8%. Samo je 4,6% ispitanika potvrdilo teškoće s erekcijom. Vjerojatnost nastupa erektilne disfunkcije sedam puta je veća kod mladića koji nisu zadovoljni svojim osobnim seksualnim životom (OR 6,75; CI 2,85-15,85; p<0,001).

Zaključak: Ovo pitanje zahtijeva pragmatičan pristup imajući na umu specifičnost populacije adolescenata, osjetljivost ovoga pitanja i često neprepoznavanje erektilne disfunkcije. Dokazano je da je nezadovoljstvo seksualnim životom snažno povezano s erektilnom disfunkcijom. Kako bi otkrili osobe s potencijalnim poremećajem, stručnjaci trebaju započeti s pitanjima o zadovoljstvu seksualnim životom, a ne ispitivati izravno o teškoćama s erekcijom.

Ključne riječi: adolescent, erektilna disfunkcija, prerana ejakulacija